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**Camp**

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(54) **LOCATION SYSTEM COMBINING  
RANGING MEASUREMENTS FROM GPS  
AND CELLULAR NETWORKS**

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(57) **ABSTRACT**

Methods and arrangements are provided for locating a mobile terminal within a mobile telecommunications system. In certain embodiments, GPS ranging signals and cellular base station transmitted downlink signals are received by a mobile terminal, which is configured to determine its current location using a combination of these two types of ranging signals. In certain other embodiments, GPS ranging signals are received by the mobile terminal, which is also configured to transmit uplink signals to cellular base stations. The current location of the mobile station is determined by fusing measured data from each of these different ranging signal transmissions. By combining the available resources of satellite and terrestrial locating processes, the potential for locating a mobile terminal is significantly increased.

**26 Claims, 6 Drawing Sheets**

